

NOTES ON MEXICAN DERMAPTERA

BY MORGAN HEBARD

The study of a large collection of Dermaptera from Panama¹ has recently necessitated comparison with a number of species represented in the unstudied material of the order from Mexico. As many interesting features are to be found in the Mexican material at hand, we take the present opportunity to record the series. The material is all in the Hebard Collection, with the exception of the few specimens otherwise credited. In addition to the types examined, four hundred and fifty-two specimens are here recorded, representing eighteen genera and twenty-seven species, of which two species are described as new.

It is evident that, in this country, which shows such diversity in both topography and climate, the Dermaptera in many sections are numerous and rich in species. A great number of species undoubtedly still remain to be recorded, while many, already reported as the same as Central and South American species, will probably be found to represent distinct but closely related forms, when sufficient collections have been made.

The preparation of a list of the Dermaptera of Mexico at present would be premature.

PYGIDICRANIDAE

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Pyragra fuscata Serville (Plate XXVIII, figures 1 and 2.)

1831. *Pyragra fuscata* Serville, Ann. Sci. Nat., xxii, p. 34. [Cayenne.]

San Rafael, Vera Cruz, Mexico, (C. H. T. Townsend), 1 ♂.

Cordoba, Vera Cruz, Mex., XI, 1887, (L. Bruner), 1 ♂.

Fortin, Vera Cruz, Mex., XI, 1887, (L. Bruner), 1 ♀.

Motzorongo, Vera Cruz., Mex., II, 1892, (L. Bruner), 9 juv.

Minatitlan, Vera Cruz, Mex., II, 1892, (L. Bruner), 11 juv.

The adults here recorded all have the tegmina dark and unicolorous. The male from San Rafael is exceptionally heavy for the species, with abdomen expanding slightly distad, disto-dorsal

¹ Trans. Am. Ent. Soc., xliii, pp. 301 to 334, (1917).

abdominal segment subquadrate and forceps extremely heavy (Plate XXVIII, figure 2). Width of disto-dorsal abdominal segment 4.1, length of forceps 4.8, basal width of forceps 1.2 mm. Additional material may show this to be a distinct species; if this proves true Dohrn's name, *saussurei*, is available.

LABIDURIDAE

PSALINAE

Anisolabis maritima (Géné)

1832. *Forficula maritima* Géné, Ann. Sci. Nat. Regn. Lomb. Venet., ii, p. 224. [Nice, France; Genoa and Tuscany, Italy; along Mediterranean.]

Aguascalientes, Aguascalientes, Mexico, I, 1892, (L. Bruner), 1 ♀.
Vera Cruz, Vera Cruz, Mex., I, 1892, (L. Bruner), 1 ♂, 1 ♀.

Euborellia annulipes (Lucas)

1847. *Forficelisa annulipes* Lucas, Bull. Soc. Ent. France, (2), v, p. XXXIV. [Jardin des Plantes, Paris (probably introduced).]

Hermosillo, Sonora, Mexico, XI, 1913, (R. S. Wolgum; in decayed orange), 1 ♀, [U. S. N. M.].

Orizaba, Vera Cruz, Mex., I, 1892, (L. Bruner), 2 ♀.

Euborellia antoni (Dohrn) (Plate XXVIII, figure 8.)

1864. *F[orcinella] antoni* Dohrn, Stett. Ent. Zeit., xxv, p. 289. [Venezuela.]

Atoyac, Vera Cruz, Mexico, XI, 1887, (L. Bruner), 2 juv.,
1 very small juv.

Tonala, Chiapas, Mex., VII, 30, 1909, (A. Petrunkivitch; in toilet), 2 ♀, [A. M. N. H.].

The present species might easily be confused with *A. annulipes*, and the features of real differential value have been so casually stated in the literature, that it is not surprising to find that Burr has assigned this name to the synonymy under that species.

Females may be separated from those of *annulipes* by the average decidedly larger size;² head with margins of cheeks, behind eyes, almost straight, parallel, to the broadly rounded latero-caudal angles, thus giving the caudal portion of the head a distinctly more quadrate appearance than in *annulipes*;³ latero-caudal angles of fifth and sixth dorsal abdominal segments sharply rounded, not broadly rounded as in *annulipes*; forceps decidedly

² As noted by Bormans. Das Tierreich, xi, p. 49, (1900).

³ This feature is noted in the original description, and, though subtle, appears to be of marked diagnostic value.

heavier and shorter in proportion to the body bulk, and femora with dark markings occupying nearly their entire cephalic and caudal faces.⁴

The pale segments of the antennae are variable, in number and location, in the species of the genus; in the present series one specimen has the eleventh and twelfth on one side and the thirteenth on the other pale, the others have the fourteenth or fourteenth and base of fifteenth pale.

Labidura bidens (Olivier)

1791. *Forficula bidens* Olivier, Encycl. Method., Ins., vi, p. 466. [Jamaica.]

Vera Cruz, Vera Cruz, Mexico, I, 1892, (L. Bruner), 1 ♂, 1 ♀.

LABIIDAE

SPONGIPHORINAE

Spongiphora prolixa Scudder

1862. *Psalidophora paralella* Dohrn (not *Forficula paralella* Westwood, 1837), Stett. Ent. Zeit., xxiii, p. 227, pl. I, figs. 3 and 3b. [Cordoba [Vera Cruz, Mexico].]

1876. *Spongiphora prolixa* Scudder, Proc. Boston Soc. Nat. Hist., xviii, p. 331. (New name for Dohrn's species.)

San Rafael, Vera Cruz, Mexico, I, 1892, (L. Bruner), 2 ♀.

It is a pleasure to record almost topotypic material of this large and striking insect, the only species of *Spongiphora*, s. s. found so far north on the North American continent.

Spongovostox apicedentatus (Caudell)

1905. *Spongophora apicedentata* Caudell, Proc. U. S. Nat. Mus., xxviii, p. 461, fig. 1a. [Columbia, Texas; Catalina Springs, Tucson and Fort Yuma, Arizona; Los Angeles and San Diego Counties, California.]

Aguascalientes, Aguascalientes, Mexico, (E. A. Schwartz), 1 ♂; XII, 1, 1909, (F. C. Bishopp; under *Opuntia*), 1 ♂, 1 ♀, 1 juv., [all U. S. N. M.].

Prosparatta humilis Hebard

1917. *Prosparatta humilis* Hebard, Trans. Am. Ent. Soc., xliii, p. 308, fig. 1, pl. XXVI, figs. 1 and 2. [Cabima, Panama; Lion Hill and Paraiso, Canal Zone, Panama.]

State of Colima, Mexico, (L. Conradt), 1 ♂, [U. S. N. M.].

This species closely resembles a depauperate condition of *Vostox brunneipennis*. The smaller eyes, not as long as the

⁴ Noted in the original description and by Bormans in Das Tierreich.

checks, and shorter caudal metatarsus, not as long as the third caudal tarsal joint, readily separates this species.

The present specimen has the head slightly shorter and the pygidium distinctly more broadly truncate at its apex, than in the males of the type series. These differences do not, in our opinion, warrant racial or other separation. Other species of the Spongiphorinae often show much greater individual variation than this.

Prosparatta flavipennula (Rehn) (Plate XXVIII, figures 3 and 4.)

1903. *Sparatta flavipennula* Rehn, Proc. Acad. Nat. Sci. Phila., 1903, p. 306. [Motzorongo, Vera Cruz, Mexico.]

Through a rather unjustifiable error Burr has mistaken a specimen from "Cayenne, Colombia" (!) as Rehn's type of this species, and, having determined that specimen as *Spongiphora insignis*, has wrongly placed *flavipennula* in the synonymy under that species.⁵

The type and a large topotypic series of both sexes now before us, shows the species to be a distinct member of the genus *Prosparatta*, differing from its nearest relative, *P. incerta* (Borelli), in the marked and extensive flange of the ventro-internal margin of the forceps in both sexes, which, in the male, is strikingly enlarged distad.⁶ Further comparison with *incerta* shows the present species to be somewhat less slender, with pronotum shorter and having its lateral margins scarcely divergent caudad, in the male with pygidium much more elongate, distinctly longer than twice its greatest width, from which point the lateral margins converge to the sharply rounded apex, and with forceps lacking a submedian tooth.⁷

The present species was known only from one⁸ immature male and one adult female. We here describe an adult male.

Topotype.—♂; Motzorongo, Vera Cruz, Mexico. February, 1892. (L. Bruner.) [Hebard Collection.]

Agrees with the originally described female, here selected as single type, except in the following characters. Disto-dorsal abdominal segment with length over half its width, lateral margins very feebly convergent caudad,

⁵ Proc. U. S. Nat. Mus., xxxviii, p. 457, (1911).

⁶ This distinctive feature shows no variation whatever in the large series before us.

⁷ In males of *incerta*, the pygidium is scarcely longer than wide, with narrow apex abruptly truncate, and the forceps bear a well developed submedian tooth.

distal margin transverse, thickened, very feebly concave laterad and broadly mesad. Pygidium, in very brief proximal portion, deplanate, other portions transversely convex; length slightly more than twice the greatest width, lateral margins very feebly convex divergent to slightly beyond median point, there with a minute rounded projection, beyond distinctly narrower, with lateral margins convergent to the sharply rounded apex. Forceps more elongate than in female, parallel to distal curvature and bearing to that point on ventro-internal margin a slight flange, with its margin subserrate to its distal portion, where it is weakly but conspicuously and broadly widened, with its margin there smooth and convex. Disto-ventral abdominal segment with length fully half its width, broadly rounded disto-laterad, with distal margin very feebly concave and supplied with a thick fringe of very short hairs.

Measurements (in millimeters) of extremes

		Length of body	Length of pronotum	Width of pronotum	Length of forceps
♂	Motzorongo. (14)	6.8-9.3	1.6-1.7	1.3-1.35	2.7-3.7
♀	Motzorongo. (14)	7.2-10	1.6-1.75	1.3-1.4	2.3-2.8

The series averages nearer the maximum.

Specimens Examined: 39; 14 males, 14 females, 11 immature examples.

Vera Cruz, Vera Cruz, Mexico, I, 1892, (L. Bruner), 1 juv.

Motzorongo, V. C., Mex., I, 1892, (L. Bruner), 14 ♂, 14 ♀, 10 juv.

MICROVOSTOX Hebard

1917. *Microvostox* Hebard, Trans. Am. Ent. Soc., xliii, p. 310.

We would note that the form of the distal antennal joints is one of the most striking features for separating the species of the present genus from those of the Labiinae. These joints in *Microvostox* are elongate, cylindrical, their diameter being the same through almost their entire length. The eyes are incorrectly given in the original description as being appreciably shorter than the cheeks. In some of the species the eyes when seen in dorsal aspect would appear slightly shorter than the cheeks, but when viewed from the side their actual length is found to be fully as great as, or appreciably greater than, that of the cheeks. The length of the caudal metatarsus ranges in the species of the genus from as long as, to appreciably longer than, the combined length of the succeeding tarsal joints; no individual variation in this feature is noted, the differences being of specific diagnostic value.

We would assign the following species to *Microvostox*, in linear arrangement as given below. Those marked with an asterisk are represented in the collections before us.

<i>*basalis</i> (Burr)	<i>parvus</i> (Burr)
<i>recurrens</i> (Burr)	<i>ghilianii</i> (Dohrn)
<i>vicinus</i> (Burr)	<i>*pygmaeus</i> (Dohrn)
<i>confusus</i> (Borelli)	<i>*septentrionalis</i> new species
<i>*alter</i> (Burr) genotype	<i>*schwarzi</i> (Caudell)
<i>*bilineatus</i>	

It would appear probable that *Labia mexicana* Bormans is a species related to *Labia barberi* Hebard; these species and those of the Championi Group of the genus *Labia* show close similarity in size and color pattern to many of the species of *Microvostox*. We feel unable to assign *Labia tricolor* Kirby.

Microvostox basalis (Burr)

1912. *Spongovostox basalis* Burr. Ann. k.-k. Nathist. Hofmus. Wien, xxvi, p. 337, fig. 16. ["El Zumbador" = El Tumbador, San Marcos, Guatemala.]

Orizaba, Vera Cruz, Mexico, I, 1892, (L. Bruner), 1 ♀; III, 13, 1908, (F. Knab), 1 ♀, [U. S. N. M.].

Cordoba, Vera Cruz, Mex., III, 24, 1908, (F. Knab), 1 ♀.

Females of this species and of *M. bilineatus* are very similar; a comparison has been made recently.⁸

Microvostox septentrionalis new species (Text fig. 1.)

1914. *Spongovostox ghilianii* ? Burr (not *Labia ghilianii* Dohrn, 1864), Can. Ent. xlv, p. 275. (In part.) [Material here considered.]

Closely related to *M. schwarzi* (Caudell), differing in the larger size and more elongate form. In the male the pygidium is of the same general type but is more elongate, with apex minutely bilobate, and forceps, which are much longer, with a small but distinct and broad tooth on the ventro-internal margin, just beyond the mesal portion of the pygidium and a smaller tooth on the same margin one-third the distance from base to apex of the shaft. In females the forceps are proportionately slightly more slender and elongate and differ in showing a moderate, irregularly toothed dorso-internal projection. Both of these species are strikingly less robust than *M. basalis* (Burr) or *M. bilineatus* (Scudder).

Type.—♂; Tampico, Tamaulipas, Mexico. July, 1912. (E. A. Schwarz.) [United States National Museum.]

⁸ See Hebard, Proc. Acad. Nat. Sci., 1917, p. 238, (1917). Females of both species have been recorded by Burr as *Vostox similis*, Can. Ent., xlv, p. 275, (1914).

Size small, medium for the genus, form decidedly slender. Antennae as typical for genus. Head small; eye, when seen from side, with greatest diameter one-third greater than length of cheek; occiput showing a very feeble tendency toward bilobation, its caudal outline very feebly emarginate. Pronotum slightly longer than greatest width, lateral margins straight and very feebly divergent to the broadly convex latero-caudal angles, caudal margin weakly convex. Tegmina and wings fully developed. Dorsal abdominal segments with scent glands of third very weak, of fourth moderately prominent. Pygidium twice as long as wide, moderately declivent and with surface convex proximo-laterad, in distal portion nearly horizontal, weakly convex, lateral margins almost straight, subparallel and supplied with microscopic teeth in proximal half, weakly convex convergent and cingulate in distal half to the apex, which is minutely emarginate with lateral projecting portions sharply rounded; dorsal surface of pygidium supplied with a few scattered microscopic nodes. Forceps with shaft slender, curving very weakly and evenly, with distal portion rounded in section and tapering to the acute apex; proximal portion with inner face deplanate, its dorsal margin rounded and showing a few microscopic denticulations beyond the pygidial apex, its ventro-internal margin slightly lamellate, particularly proximad, showing microscopic denticulations, produced in a small but distinct and broad tooth just beyond the mesal portion of the pygidium, and a smaller tooth one-third the distance from base to apex of the shaft. Caudal metatarsus slightly longer than combined length of succeeding tarsal joints, ventral surface well supplied with stiff hairs.



FIG. 1.

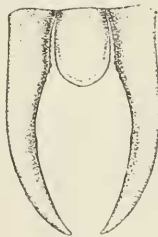


FIG. 2.

Fig. 1. *Microvostox septentrionalis* new species. Dorsal view of pygidium and forceps of male. Type. (X 18)

Fig. 2. *Microvostox schwarzi* (Caudell). Dorsal view of pygidium and forceps of male. Motzorongo, Vera Cruz, Mexico. (X 18).

Allotype.—♀; same data as type. [United States National Museum.]

Size moderately larger, form and ambisexual features with proportions as described for male. Tegmina and wings fully developed. Pygidium concealed between bases of forceps. Forceps briefly separated, slightly heavier

and decidedly shorter than in male; shaft straight and weakly tapering to near apex, where it is weakly incurved, strongly tapering and slightly flattened in cross section, proximal portion subtriquetrous, ventro-internal margin weakly lamellate and roughly and irregularly denticulate, this moderately so in proximal portion of mesal third, the dorso-internal margin showing a brief, weak, irregularly projecting proximal flange which terminates caudad in an irregular blunt tooth, this margin beyond showing a few blunt denticulations.

Measurements (in millimeters)

	Length of body	Length of pronotum	Width of pronotum	Length of tegmen	Length of forceps
♂, <i>type</i>	5.4	.9	.85	1.65	2.3
♀, <i>allotype</i>	6.6	.95	.85	1.7	1.7

The allotype is somewhat pressed out, the length measurement being, in consequence, greater than if the specimen were in normal position.

General coloration shining blackish brown, the brown more decided on tegmina, distal portion of abdomen and on forceps. Tegmina with an elongate streak of buffy on each shoulder, extending one-half the distance to the apex. Wings with exposed surface buffy, suffused with dark brown rather broadly along sutural margin, very narrowly along costal margin.

The species is known from the described pair.

Microvostox schwarzi (Caudell) (Text fig. 2.)

1907. *Labia schwarzi* Caudell, Proc. U. S. Nat. Mus., xxxiii, p. 173. [Cacao, Trece Aguas, Guatemala.]

Motzorongo, Vera Cruz, Mexico, II, 1892, (L. Bruner), 5 ♂, 6 ♀, 2 juv.

These specimens show little variation and agree fully with the typical series which is before us, and from which we select a male example as single type.

LABIINAE

Labia nodifer Hebard

1917. *Labia nodifer* Hebard, Proc. Acad. Nat. Sci. Phila., 1917, p. 240, pl. XVI, fig. 5. [Cacao, Trece Aguas, Alta Vera Paz, Guatemala.]

Fortin, Vera Cruz, Mexico, XI, 1887, (L. Bruner), 1 ♀.

Cordoba, Vera Cruz, Mex., III, 1908, (F. Knab; in bromeliads), 1 ♂, [U. S. N. M.].

These specimens were measured and listed at the time the species was described.

Labia rotundata Scudder

1876. *Labia rotundata* Scudder, Proc. Bost. Soc. Nat. Hist. xviii, p. 257. [Mexico.]

1903. *Labia flaviscuta* Rehn, Proc. Acad. Nat. Sci. Phila., 1903, p. 305. [Orizaba, Vera Cruz, Mexico.]

We have examined the type of *flaviscuta* Rehn and are able in consequence to place that name in the synonymy under *rotundata*. The type of *flaviscuta*, a female, is small and of pale coloration with colors well preserved. The pronotum and limbs are yellowish, the former with the dark brown of the tegmina showing through caudad, this giving the pronotum a bicolored appearance. The type of *rotundata* before us shows these features, but to a much less conspicuous degree, the colors having been less well preserved in drying.

An additional female from Orizaba, Vera Cruz, Mexico, and an unlabelled pair of this species from the National Museum have been examined and compared with other species of the genus.⁹

The pygidium of the female type of *rotundata* has recently been figured.¹⁰

Labia dorsalis (Burmeister)

1838. *F[orficula] dorsalis* Burmeister, Handb. Ent., ii, ii abth., pt. i, p. 754. [Colombia.]

Motzorongo, Vera Cruz, Mexico, II, 1892, (L. Bruner), 2 ♂.

Cordoba, Vera Cruz, Mex., XII, 6, (F. Knab), 1 ♂, [U.S.N.M.].

This species, which has usually appeared in the literature as the synonymous *L. chalybea* of Dohrn, has been recently fully considered, as noted under *L. rotundata*. It is clearly not a synonym of *L. annulata*, under which species Burr assigned, at the same time, *arcuata*, *dorsalis* and other names.

Prolabia arachidis (Yersin)

1860. *Forficula arachidis* Yersin, Ann. Soc. Ent. France, (3), viii, p. 509, pl. X, figs. 33 to 35. [[Adventive at] Marseilles, France.]

Vera Cruz, Vera Cruz, Mexico, (T. Heyde), 1 ♀.

Individuals of this species are usually very greasy and thoroughly unpleasant.

Prolabia triquetra¹¹ new species (Plate XXVIII, figures 5, 6 and 7.)

This species is closely related and very similar in general appearance to *P. arachidis*, differing greatly in the character of the forceps in both sexes. The adults before us, with one exception, show fully developed wings.

⁹ See Hebard, Trans. Am. Ent. Soc., xliii, p. 317, (1917).

¹⁰ Proc. Acad. Nat. Sci. Phila., 1917, pl. XVI, fig. 7.

¹¹ In allusion to the forceps, which are conspicuously triquetrous in both sexes.

Type.—♂; Orizaba, Vera Cruz, Mexico February 20, 1892. (L. Bruner.) [Hebard Collection Type No. 435.]

Size rather small, form moderately stout, but not as stout as in *arachidis*. Head as in that species, moderately convex with sutures obsolete; distal antennal joints not as elongate as in *arachidis*, longest about three times as long as greatest, meso-distal, width.¹² Antennae with twelve to thirteen joints,¹³ one or two of the distal joints being pale. Pronotum subquadrate, caudal margin weakly convex-truncate;¹⁴ prozona rather decidedly convex proximad with brief but distinct, convex, meso-lateral sulci which converge caudad, weakly convex meso-caudad; metazona deplanate, with lateral margins feebly raised; the pronotum shows a feeble, medio-longitudinal, linear sulcus which is strongest cephalad. Tegmina nearly twice as long as pronotum, truncate distad; wings extending beyond tegmina about two-thirds the pronotal length, narrowly truncate distad. Abdomen showing more hairs than in *arachidis*; second and third dorsal segments feebly and roundly keeled laterad, seventh and eighth dorsal segments with disto-lateral angles very broadly rounded, disto-dorsal segment simple, as in *arachidis*, showing a very feeble convex projection above each arm of the forceps. Pygidium, as in *arachidis*, subquadrate, slightly longer than wide, with disto-lateral portions briefly cut off obliquely and distal margin transverse, weakly concave. Forceps triquetrous, dorsal and ventral surfaces deplanate, hairy; inner surface deplanate between the distinctly raised margins at the juncture with the dorsal and ventral surfaces, dorsal margin smooth, ventral margin with a minute offset tooth at the disto-lateral portion of the pygidium and with a minute tooth at twice this distance from the base of the forceps.¹⁵ Penultimate ventral abdominal segment hairy, nearly three times as broad as long, with distal margin broadly convex and showing a feeble mesal concavity.

Allotype.—♀; same data as type. [Hebard Collection.]

Agrees with type except in the following characters. Size slightly larger, form slightly more robust than in male, not as stout as in this sex of *arachidis*. Disto-dorsal abdominal segment over twice as broad as long, distinctly narrower caudad than cephalad, weakly concave meso-distad, caudal margin truncate. Pygidium declivent, small, rectangular, disto-ventral portion inset between the forceps, its ventral surface in the same plane with ventral surface

¹² In *arachidis* fully four times as long as the greatest width, which is found at the apex.

¹³ In the type the antennae are incomplete. These features are, in consequence, determined from the series.

¹⁴ In the female before us lacking wings, the pronotum is as typical in *arachidis*, with caudal margin very weakly convex-truncate, in mesal portion almost perfectly transverse. This difference may very probably be found to accompany reduction in the organs of flight, a condition which has been found to occur almost universally in the Blattidae.

¹⁵ In the type this second tooth is missing on the dextral arm, in the paratype male it is present on both arms.

of forceps and its narrow distal margin transverse, with disto-lateral angles produced in acute-angulate, but rounded, minute projections.

Measurements (in millimeters)

	♂	Length of body	Length of pronotum	Width of pronotum	Length of tegmen	Length of forceps
Orizaba. <i>Type</i> .		6.5	1.15	1.2	1.9	2.6
Minatitlan. <i>Paratype</i> .		6	1.15	1.2	2	3
	♀					
Orizaba. <i>Allotype</i> .		8	1.2	1.3	2.1	2.1
Orizaba. <i>Paratypes</i> .		6-8	1.2-1.3	1.2-1.35	1.4-1.9	1.7-2.1
Chalchicomula. <i>Paratype</i> .		8	1.2	1.3	2.3	2.2

Coloration. Male. (*Type*.) Head blackish chestnut brown; antennae prouts brown, one or two of the distal joints pale (in series). Pronotum, tegmina and wings cinnamon brown. Abdomen chestnut, suffused proximolaterad with blackish chestnut brown. Forceps chestnut. Limbs dresden brown above, paler below. The male paratype and the females before us are more unicolorous, chestnut in general coloration with proximo-lateral abdominal suffusion obsolete. A marked recession and intensification is shown by the series, the small wingless female from Orizaba being the darkest of all.

Specimens Examined: 8; 2 males, 5 females, 1 immature example.

Orizaba, Vera Cruz, Mexico, I, 9 to 16, 1892, (H. Osborn), 1 ♀¹⁶ *paratype*, [U. S. N. M.]; II, 20, 1892, (L. Bruner), 1 ♂, 3 ♀, *type*, *allotype* and *paratypes*, 1 juv.

Minatitlan, Vera Cruz, Mex., II, 1892, (L. Bruner), 1 ♂, *paratype*.

Chalchicomula, Puebla, Mexico, (L. Bruner), 1 ♀, *paratype*.

SPARATTINAE

Sparatta w-signata Burr (Plate XXVIII, figure 9.)

1904. *Sparatta w-signata* Burr, Trans. Ent. Soc. London, 1904, p. 302. [Mexico.]

Motzorongo, Vera Cruz, Mexico, II, 1892, (L. Bruner), 2 ♂, 6 ♀.

This series shows little structural or color variation. The tegmina and wings are black with a metallic bluish luster, this distinctly less vivid than in *S. biolleyi* or *S. pulchra*. The distodorsal abdominal segment, in both sexes, shows the impressed W, with bases not reaching the caudal margin of the segment and broadly rounded.

The male pygidium is perpendicular, with surface convex, its length equalling its distal width, the distal margin transverse, cingulate, terminating on each side in a minute, rounded knob. The male forceps show the proximal triquetrous portion to have

¹⁶ Recorded by Rehn in 1903 as *Labia guttata*, and by Burr in 1910, with a question, as *Labia unidentata*.

its dorsal margin crenulate in one, very feebly so in the other specimen; in both, the ventro-internal margins of this portion are rather minutely denticulate than crenate as originally described, with a single stout, distal tooth, this tooth, however, smaller than the median tooth. The dilation beyond the median tooth is acute-angulate distad rather than toothed.

The female has the pygidium longer than broad, with lateral margins strongly concave, convergent, then divergent for a shorter distance to the acute-angulate, disto-lateral angles, the distal margin briefly acute-angulate produced to a less degree, with apex of the production blunt. The female forceps are nearly straight, with ventral margin produced in a moderate flange to the arcuate distal portion, this flange showing rather widely spaced, blunted teeth to just beyond the mesal portion, where it is weakly angulate produced, from this point distad the flange is narrower, with margin smooth, to its weakly convex termination.

Measurements (in millimeters)

			Length of body	Length of pronotum	Length of tegmen	Length of forceps
♂	Motzorongo.	(2)	10-10.7	1.6-1.7	2.8-3	3.8-4.1
♀	Motzorongo.	(5)	9.5-10.6	1.6-1.7	2.7-2.8	2.3-2.7

The only other species of the genus described from Mexico, *S. bormansi* Kirby, is described as having, in the female type, the pygidium with central part projecting rectangularly and longer than the basal part.

Parasparatta dentifera (Rehn) (Plate XXVIII, figures 10 and 11.)

1901. *Sparatta dentifera* Rehn, Trans. Am. Ent. Soc., xxvii, p. 218. [Orizaba, Vera Cruz, Mexico.]

1907. *Sparatta minuta* Caudell, Proc. U. S. Nat. Mus., xxxiii, p. 172. [Polo-chic River below mouth of Cahabon River, Guatemala.]

The types of *dentifera* and *minuta* show the unquestionable synonymy indicated above. It should be noted that Rehn mistook the female type of *dentifera* for a male and described it as such. The present series of adult males shows this species to be widely distinct from Burr's *P. armata*. It is clear that Burr, in the Genera Insectorum, indulged too freely in conjecture when he placed, with queries, *dentifera* (with other names, three of which we find to represent valid species) under *S. pelvimetra* and *minuta* under *P. armata*.

Excellent figures of this insect are given by Bormans in the *Biologia*, as *S. nigrina*, plate I, fig. 11 being the dorsal aspect of the male, fig. 12 showing further error by that author, as it is, in fact, an excellent outline of the ventral aspect of the pygidium and forceps of the same sex, though stated to be of the female. Borelli has pointed out this association in part, describing the male and giving further characters for the female, in addition to a full comparison with *P. nigrina* (Stål).¹⁷ In this connection, we would remark that, in the series before us, the antennae are uniform in coloration or have the proximal joints only slightly darkened.

Never, in our experience, has a series of the same species shown more startling variation than the present. Some specimens are tremendously larger than others. The normal coloration is, head, pronotum, tegmina, wings and dorsal surface of abdomen to ultimate segment, shining blackish, the ultimate segment, pygidium and forceps shining ferruginous; often the contrast between these colors is less decided and, in one specimen, the general coloration is prouts brown, with ultimate dorsal abdominal segment, pygidium and forceps slightly paler. The male pygidium, however, shows the greatest individual differentiation, in the two larger males and one of the smaller males it has the meso-distal production rectangulate, slightly longer than wide (Plate XXVIII, figure 10), in the other smaller males it is triangular, with apex very briefly truncate, varying to acute, in length slightly greater than its proximal width. Many of the smaller males show forceps with contour variously somewhat simplified and with the three teeth on each arm reduced. In the smallest male before us the forceps have retained, in large part, the immature form; the sinistral being simple and unarmed, the dextral only weakly specialized and with only the median and distal tooth weakly developed.

This insect is clearly one of those plastic species in which features of full and fixed diagnostic specific value in other related forms, show decided individual differences.

¹⁷ Boll. Mus. Zool. Anat. Comp. Univ. Torino, xxx, no. 699, p. 3, (1915).

Measurements (in millimeters)

♂	Length of body	Length of pronotum	Length of tegmen	Length of forceps	Length of pygidium
Orizaba.	8	1.2	1.6	3.1	1.1
Orizaba.	6.4	1.1	1.4	2.8	.9
Motzorongo. (5)	4.5-5.2	.8-.9	1.2-1.2	1.6-2.1	.35-.5
Motzorongo ¹⁸	4	.7	1.2	1.3	.35
♀					
Orizaba, <i>Type</i> .	7	1.2	1.7	2.5	
Orizaba.	5.3	.8	1.2	1.7	
Motzorongo. (4)	5-6.2	.8-.9	1.1-1.2	1.8-1.9	

It is to be noted that, with the reduction in size, the reduction in the male pygidium is greater proportionately to that in the forceps. In the largest male the pygidium is over one-third the length of the forceps, in the next largest male one-third, while in the series of small males the pygidium averages about one-quarter the length of the forceps.

Specimens Examined: 16;¹⁹ 10 males and 6 females.

Orizaba, Vera Cruz, Mexico, I and II, 20, 1892, (L. Bruner), 2 ♂, 1 ♀; VI, 6, 1899, (O. W. Barrett), 1 ♀, *type*, [A. N. S. P.].

Motzorongo, Vera Cruz, Mexico, II, 1892, (L. Bruner), 8 ♂, 4 ♀.

FORFICULIDAE

ANECHURINAE

Anechura vara (Scudder) (Plate XXVIII, figures 12, 13 and 14.)

1876. *Forficula vara* Scudder, Proc. Bost. Soc. Nat. Hist., xviii, p. 260. [Puebla (terra frigida), Mexico.]

Chalchicomula, Puebla, Mexico, II, 1892, (L. Bruner), 26 ♂, 33 ♀.

When compared with Burr's diagnosis of the genus and material of the genotype, *A. bipunctata* (Fabricius), the present insect is found to differ in having the fifth antennal joint longer than the third; the male having the ultimate dorsal abdominal segment smooth and without projections above, but with a bluntly conical projection on each side ventrad, at the juncture with the subchitinous, bilobate subgenital plate.²⁰ These features may require the separation of *vara* from the genus *Anechura*, but we

¹⁸ Forceps not fully developed, smallest and least brilliantly colored specimen.

¹⁹ We have also examined the type of Caudell's synonymous *S. minuta*, from Guatemala.

²⁰ These projections are homologous to the spiniform tubercles found in *Praos perditus* (Borelli), which author described them as being on the subgenital plate.

have at present an insufficient representation of the species of the present subfamily to determine this.

In the present species the antennae have eleven (twelve, normal) to thirteen (rare) joints, the fourth being normally subequal in length to the third, but showing some individual variation. The tegmina have their sutural margins sometimes fused. The size variation is moderately decided, but the male forceps show great variation, the series before us showing every gradation between the extremes.²¹ With reduction in the heaviness and irregularity of contour of the male forceps, the latero-ventral projections are correspondingly reduced. Length of body, ♂, 6.4 to 10; ♀, 6.1 to 9.5: of forceps, ♂, 2.8 to 3.2; ♀, 2.4 to 2.9 mm.

The heavier forceps are so much more curved than the more simple type, which is usually found in the smaller examples, that little difference in the actual length is found.

FORFICULINAE

Skalistes lugubris (Dohrn) (Plate XXVIII, figures 15 and 16.)

1862. *Forficula lugubris* Dohrn, Stett. Ent. Zeit., xxiii, p. 230. [Cordoba [Vera Cruz], Mexico.]

1903. *Forficula metrica* Rehn, Proc. Acad. Nat. Sci. Phila., 1903, p. 311. [Orizaba, Vera Cruz, Mexico.]

Orizaba, Vera Cruz, Mexico, I, 13, 1892 and XI, 1887, (L. Bruner), 20 ♂, 32 ♀, 2 juv.

Chalchicomula, Puebla, Mex., II, 1892, (L. Bruner), 3 ♂, 4 ♀.

As Burr has shown, Rehn's *metrica* is based on the condition of this species in which elongate forceps are developed.

We do not believe that *S. inopinata* (Burr) and *S. cornuta* (Burr)²² are synonymous, as that author has indicated. The proximo-internal dorsal flange of the male forceps is slightly more prominent in the specimens before us with short forceps, but no trace of a dorsal conical projection is found. In the present insect the male forceps have this flange with margin cingulate and unbroken, below it a row of denticulations are found, from above only visible proximad before the commencement of the flange. The variation in both length and degree of curvature of the male forceps is very marked in the present series.

²¹ See plate XXVIII, figures 12, 13 and 14.

²² This name was proposed for the male sex described by Bormans as *Labia cheliduroides*.

Length of body, ♂, 7.5 to 9.8; ♀, 8.7 to 9.5: of forceps, ♂, 3.8 to 8.7; ♀, 3.3 to 4.1 mm.

Doru lineare (Eschscholtz)

1822. *Forficula linearis* Eschscholtz, Entomogr., p. 81. [Santa Catharina, Brazil.]

The synonymy of the present species and the Mexican material represented in the present collections has been fully studied.²³

NEOLOBOPHORINAE

Neolobophora ruficeps (Burmeister)

1838. *F[orficula] ruficeps* Burmeister, Handb. Ent., ii, ii abth., pt. i, p. 755. [Mexico.]

Atoyac, Vera Cruz, Mexico, XI, 1887, (L. Bruner), 1 ♂.

Fortin, Vera Cruz, Mex., XI, 1887, (L. Bruner), 4 ♂, 1 ♀, 1 juv.

Orizaba, Vera Cruz, Mex., I, 13, 1892, (L. Bruner), 5 ♂, 7 ♀.

Motzorongo, Vera Cruz, Mex., II, 1892, (L. Bruner), 2 ♂, 1 juv.

Chalchicomula, Puebla, Mex., II, 1892, (L. Bruner), 1 ♀.

Burmeister's description, though very incomplete, is sufficient to determine the species without question; Scudder's more fully described *volSELLA*, has been shown to be an absolute synonym.

It is of interest to note that the Mexican series before us differs in the following respects from the features considered diagnostic for *ruficeps* by Burr.²⁴ The tegmina and caudal portions of the pronotum are smooth in these specimens, the male pygidium with the form of its two apical projections varying from elongate trigonal (as found in the majority of the present series and in all the Costa Rican and Panamanian specimens before us), to minute, and sharply conical, these disto-lateral in position. The smoothness or roughness of the tegmina and caudal portions of the pronotum is evidently of no specific value in *ruficeps*, though it apparently has some geographic significance. In a species as variable as the present, we would strongly oppose the separation of the more southern series as a distinct geographic race. At any rate, the species was described from Mexico and, from the material at hand, we believe the typical condition to be that with smooth pronotum and tegmina.

²³ Rehn and Hebard, Jour. N. Y. Ent. Soc., xxii, p. 90, figs. 1 to 4, (1914).

²⁴ Ent. Monthly Mag., Ser. 2, xvii, p. 112, (1906).

We find it necessary, in consequence, to furnish a new comparison between the males of *N. ruficeps* and *N. borellii*.

	<i>N. ruficeps</i>	<i>N. borellii</i>
First tarsal joint normally ²⁵	as long as three succeeding joints	decidedly shorter than three succeeding joints
Tegmina with surface	smooth or punctulate	smooth
In length	less abbreviate	more abbreviate
Pygidium with projections	triangular elongate or minute conical	blunt or absent
Forceps, compared with body length	shorter to longer than	shorter than
Both internal margins	minutely denticulate to varying degrees	smooth
Medio-internal, proximal tooth	minute and inconspicuous	small but striking
Internal margins armed	dorsad and ventrad, at middle, or just beyond, with a minute tooth	ventrad only, at two-thirds distance to apex, with a rather heavy tooth
Shaft	nearly straight	upcurved at distal tooth
First tarsal joint of caudal limbs	scarcely longer than second and third	decidedly longer than second and third

In the present series the distal, darkened portions of the femora are striking, except in some specimens in which the limbs are entirely darkened. The face is darkened, but only in a few specimens sharply and strikingly delimited from the paler occipital portions, which is the normal condition in the Costa Rican and Panamanian series.

***Neolobophora borellii* Burr**

1906. *Neolobophora borellii* Burr, Ent. Monthly Mag., Ser. 2, xvii, p. 113. [Near Guadalajara, Jalisco, Mexico.]

Sonora, Mexico, (C. Lumholtz), 3 ♂, 3 ♀, [A. M. N. H.].

This species is compared with *N. ruficeps* above, the characters for *borellii* being taken from Burr's original description and from the present series. The series before us differs from Burr's description in pronotal coloration and contour of male pygidium. These features, we believe, show only variation, in some ways analogous to the variation found in *ruficeps*, not worthy of specific or racial distinction.

²⁵ In rare specimens, evident distortion of the antennal joints is found on one, or both, sides; in one example of *borellii*, the second, third and fourth joints are greatly dwarfed.

In the present material the third and fourth dorsal abdominal segments have well developed, brief, rounded, lateral carinae (the stink-glands), those of the fourth segment being the larger. The male pygidium is declivent, slightly longer than broad, with narrow proximal portion concave and large distal portion convex in contour, nearly circular in outline, without trace of distolateral projections. The caudal limbs have the first tarsal joint decidedly longer than the combined length of the second and third joints.

These specimens have the head, antennae, limbs, greater portion of pronotum and the tegmina along the humeral angle, cinnamon rufous. The large meso-caudal portion of the pronotum, remaining area of tegmina, the abdomen and forceps are chestnut brown.

ANCISTROGASTRINAE

The forms of this group are varied and striking, the specialization of the male dorsal abdominal segments being in many species remarkable.

We are forced to change the generic association of a number of species, the evidently wrong assignments being mainly due to the separation of genera upon the but rarely valid character of presence or absence of fully developed wings. Had we material for comparison of all the species involved, the task would be less difficult. The presence in the collections before us, of the species *perditus*, genotype of Burr's *Praos*, and *championi*, genotype of Burr's *Vlax*, enables us to reach definite and important conclusions. The descriptions are exceptionally adequate and numerous figures are given of the other species with which we are concerned. The results may be summed up as follows.

The structure of *championi*, genotype of *Vlax*, shows much closer similarity to that of *perditus*, genotype of *Praos*, than to any of the other species assigned to *Vlax*;²⁶ this is also true for *perditus*, when compared with *impennis*, assigned by Burr with a query to *Praos*.²⁷ Indeed no sufficiently important features

²⁶ It is evident that Burr drew up his original description of *Vlax* from *tolteca* of Scudder, though he chose *championi* of Bormans as the genotype.

²⁷ The features compelling this assignment have been discussed in a paper on Panamanian Orthoptera, the species involved being in no way associated with the Mexican fauna. We would note that recently Borelli has described a species as *Praos uncinatus*, this insect being clearly a member of the genus *Ancistrogaster*. That author has very kindly sent us a figure of the forceps, drawn from the type of this species.

occur to warrant the generic separation of the species *perditus* and *championi* and, in consequence, *Vlax* must fall as a synonym of *Praos*, which name has page priority. The genus *Praos* resultantly is found to include one species with, and one without, fully developed wings. Proceeding further, from the material of *tolteca* before us (assigned by Burr to *Vlax*),²⁸ of *gulosa* (originally referred to *Ancistrogaster*), and the excellent description and figures of *impennis* (assigned by Burr with a query to *Praos*), *silvestrii* and *dugesii* (assigned by Borelli and Burr to *Paracosmia*, of which *silvestrii* is the genotype), it is clear that these species are congeneric, *tolteca* and *gulosa* having fully developed wings. As a result, the known Mexican species of the Ancistrogastriinae are all referable to *Paracosmia*, with the exception of *Ancistrogaster spinax* and *uncinatus*.

PARACOSMIA Borelli

1909. *Paracosmia* Borelli, Boll. Lab. Zool. Scuola Agr. Portici, iii, p. 323.

The following modifications of the original description are made. Wings concealed or fully developed. Abdomen of male more or less dilated mesad or meso-distad, dorsal surface weakly convex; stink gland of third segment small, of fourth segment large; fifth, or fifth, sixth and seventh dorsal segments weakly angulato-produced dorso-laterad, in decreasing ratio caudad and there feebly keeled. Dorsal surface of female abdomen with stink glands, but without dorso-lateral production. Disto-dorsal abdominal segment of male with sides straight or angulato-emarginate, dorsal surface little specialized in contour, margins ventrad on each side, at juncture with subgenital plate, produced in two minute, angulate projections, with apices blunt. Male forceps variously armed.²⁹

Paracosmia tolteca (Scudder) (Plate XXVIII, figures 17, 18 and 19.)

1876. *Forficula tolteca* Scudder, Proc. Bost. Soc. Nat. Hist., xviii, p. 261. [Mexico.]

²⁸ Two other species, *intermedius* and *festae*, were assigned to *Vlax* by Burr. These are both South American, and would appear to represent a genus, or genera, not found in the Central American fauna.

²⁹ As given by Borelli for the genus, the caudal metatarsus is equal to the combined length of the second and third joints in *P. gulosa*, but in *P. tolteca* it is distinctly more elongate than that measurement. We do not feel that sufficient difference is, however, shown by *tolteca* to warrant generic separation.

Orizaba, Vera Cruz, Mexico, I, 9 to 16, 1892 and XI, 1887, (Bruner; Osborn), 43 ♂, ³⁰ 80 ♀, 21 juv.

Cordoba, Vera Cruz, Mex., XII, 6, (F. Knab), 1 ♂, [U.S.N.M.].

The male forceps are found to vary from very weakly to strongly bowed: in the former type the heavy ventro-internal tooth is situated mesad or meso-proximad; in the latter this tooth is situated distad or meso-distad. The extremes, and an almost intermediate condition, are about equally represented in the series, the majority of intermediates have the ventro-internal tooth distad or meso-distad. The dissimilarity in general appearance, caused by this feature, is very great. In all the adults before us, the wings are fully developed, in some of the females being somewhat shortened, with exposed portion shorter than the length of the pronotum.

In this series the general coloration varies from cinnamon brown to almost black. The exposed portions of the tegmina are immaculate, or have a small, buffy proximal area, this varying individually in extent, but usually very small.

Paracosmia gulosa (Scudder)

1876. *Ancistrogaster gulosa* Scudder, Proc. Bost. Soc. Nat. Hist., xviii, p. 259. [Puebla (terra frigida), Mexico.]

Through the kindness of Dr. Samuel Henshaw, we have before us four males and one female, cotypes, of which we select a large male as the single type, the female as the allotype. These specimens were taken by Sumichrast, in the month of January.

The species is closely related to the genotype, *silvestrii*, differing mainly in the presence of fully developed wings. It is possible that large series will show that in this group individuals of the same species may have fully developed, reduced or absent wings, in which case *silvestrii* will probably be found a synonym of *gulosa*.

The proportionately much larger pronotum, which is much wider than the dorsal width of one of the tegmina, readily distinguishes individuals of both sexes from those of the Mexican species, *Ancistrogaster spinax* and *A. uncinatus*.

³⁰ Rehn, in 1903, recorded males with forceps slightly bowed as *Ancistrogaster tolteca*, those with forceps strongly bowed as *Ancistrogaster gulosa*.

Measurements (in millimeters)

	♂					
Type.	Length of body	Length of pronotum	Width of pronotum	Length of tegmen	Exposed length of wing	Length of forceps
Paratype.	12.8	1.8	1.9	3.6	1.6	4.4
	10.2	1.7	1.9	3.2	1.3	3.8
	♀					
Allotype.	11	1.9	2.1	3.4	1.7	3.3

The small series before us shows that the same type of variation in the male forceps is developed in *P. tolteca* and *gulosa*. The two largest males have strongly bowed forceps; these specimens are heavier than the other two males and have the disto-lateral angles of the fourth to sixth dorsal abdominal segments more sharply produced. The smallest male paratype is measured above.

Ancistrogaster spinax Dohrn

1862. *Ancistrogaster spinax* Dohrn, Stett. Ent. Zeit., xxiii, p. 229, pl. I, fig. 1.
[No locality given.]

Jalapa, Vera Cruz, Mexico, VIII and IX, (O. W. Barrett),
1 ♂, 5 ♀, [A. N. S. P. and Hebard Cln.].

Teocelo, Vera Cruz, Mex., IX, (O. W. Barrett), 3 ♂, 1 ♀,
[A. N. S. P.].

These specimens have been previously recorded by Rehn, in part correctly, in part as *A. luctuosus*.

Ancistrogaster uncinatus (Borelli)

1915. *Praos uncinatus* Borelli, Boll. Mus. Zool. Anat. Comp. Univ. Torino, xxx, no. 699, p. 3. [Jalapa, Mexico.]

Cordoba, Vera Cruz, Mexico, I, 27 to II, 10, 1908 (F. Knab),
1 ♂, 2 ♀,³¹ [U. S. N. M.].

Presence or absence of wings or of an internal proximal tooth of the forceps is of no generic significance in the present subfamily.³² The present insect does not agree with the general structural development in the genus *Praos*, but shows a structural development characteristic of species of the genus *Ancistrogaster*.

The specimens before us all have fully developed wings, which organs are absent in the type of *uncinatus*, which is smaller than

³¹ This probably represents the material recorded by Burr as *A. variegata*, Can. Ent., xlv, p. 276, (1914).

³² See Hebard, Trans. Amer. Ent. Soc., xliii, p. 330, (1917).

the male before us, and does not have two minute, internal, slender, rounded projections on each branch of the forceps, one ventrad at the pygidium, the other dorsad a distance caudad equal to the pygidial width, as in this specimen. In other respects the material before us is typical. We do not believe that presence or absence of wings, or such differences from the type as shown by the male at hand, will be found of specific diagnostic value in this or other species of the present group.

The remarkably produced and decurved fifth to seventh dorsal segments of the male abdomen are a striking feature in males of this species. The pronotum differs from that of *A. spinax* in having the latero-caudal angles indicated, the margin from the latero-cephalic angles not being evenly convex as in *spinax*. This is one of the best features to separate females of *uncinatus* and *spinax*, which are very similar in general appearance.

Explanation of Plate XXVIII

The figures, unless otherwise specified, are all greatly enlarged.

- Fig. 1.—*Pyragra fuscata* Serville. Dorsal view of apex of male abdomen and forceps, normal condition. Fortin, Vera Cruz, Mexico. ($\times 2.4$)
- Fig. 2.—*Pyragra fuscata* Serville. Dorsal view of apex of male abdomen and forceps, showing very unusual differentiation. San Rafael, Vera Cruz, Mexico. ($\times 2.4$)
- Fig. 3.—*Prosparratta flavipennula* (Rehn). Dorsal view of male pygidium. Motzorongo, Vera Cruz, Mexico. *Topotype*.
- Fig. 4.—*Prosparratta flavipennula* (Rehn). Dorsal view of apex of male abdomen and forceps. Motzorongo, Vera Cruz, Mexico. *Topotype*. ($\times 6.4$)
- Fig. 5.—*Prolabia triquetra* new species. Outline of female antenna. Orizaba, Vera Cruz, Mexico. *Allotype*.
- Fig. 6.—*Prolabia triquetra* new species. Dorsal view of sinistral arm of male forceps. Orizaba, Vera Cruz, Mexico. *Type*. ($\times 9.2$)
- Fig. 7.—*Prolabia triquetra* new species. Dorsal view of apex of female abdomen and forceps. Orizaba, Vera Cruz, Mexico. *Allotype*. ($\times 6.5$)
- Fig. 8.—*Euborellia antoni* (Dohrn). Lateral view of apex of female abdomen and forceps. Tonala, Chiapas, Mexico. ($\times 2.1$)
- Fig. 9.—*Sparatta w-signata* Burr. Dorsal view of apex of male abdomen and forceps. Motzorongo, Vera Cruz, Mexico. ($\times 4$)
- Fig. 10.—*Parasparatta dentifera* (Rehn). Dorsal view of apex of male abdomen and forceps, showing highest specialization. Orizaba, Vera Cruz, Mexico. *Topotype*. ($\times 4.4$)
- Fig. 11.—*Parasparatta dentifera* (Rehn). Dorsal view of apex of female abdomen and forceps. Orizaba, Vera Cruz, Mexico. *Topotype*. ($\times 5.3$)
- Fig. 12.—*Anechura vara* (Scudder). Lateral outline and dorsal view of male forceps, showing highest specialization. Chalchicomula, Puebla, Mexico. ($\times 5.8$)
- Fig. 13.—*Anechura vara* (Scudder). Lateral outline and dorsal view of male forceps, showing moderate specialization. Chalchicomula, Puebla, Mexico. ($\times 4$)
- Fig. 14.—*Anechura vara* (Scudder). Lateral outline and dorsal view of male forceps, showing least specialization. Chalchicomula, Puebla, Mexico. ($\times 4.5$)
- Fig. 15.—*Skalistes lugubris* (Dohrn). Dorsal view of male forceps, showing highest specialization. Orizaba, Vera Cruz, Mexico. ($\times 3.7$)
- Fig. 16.—*Skalistes lugubris* (Dohrn). Dorsal view of male forceps, showing least specialization. Orizaba, Vera Cruz, Mexico. ($\times 3.3$)

- Fig. 17.—*Paracosmia tolteca* (Scudder). Dorsal view of male forceps, showing highest specialization. Orizaba, Vera Cruz, Mexico. ($\times 4$)
- Fig. 18.—*Paracosmia tolteca* (Scudder). Dorsal view of male forceps, showing moderate specialization. Orizaba, Vera Cruz, Mexico. ($\times 3.7$)
- Fig. 19.—*Paracosmia tolteca* (Scudder). Dorsal view of male forceps, showing least specialization. Orizaba, Vera Cruz, Mexico. ($\times 3.8$)